TECHNISCHE UNIVERSITÄT DRESDEN

Faculty of Business and Economics
Chair of Quantitative Methods, esp. Econometrics (Prof. Dr. Cygan-Rehm)

Module "Advanced Topics in Applied Econometrics"

Summer semester 2025

Outline

The ability to understand empirical research and perform appropriate data analysis is now a central skill in economics. This course introduces selected advanced methods of applied econometrics with a focus on state-of-the-art causal inference methods. The lecture follows an example-driven approach, i.e. all methods and concepts are illustrated with examples from economic policy and research contexts. To intensify the learning success and to foster students' data literacy and programming skills, the lecture will be accompanied by hands-on exercises with real data using the statistical software Stata. The focus is on the following topics:

I. Review of basic concepts of causal inference
II. Matching
III. Difference-in-differences: recent developments
IV. Instrumental variables: shift-share instruments and marginal treatment effects
V. Regression discontinuity: local linear regressions and kink design

By the end of the course, students will be able to propose appropriate empirical designs and apply state-of-the-art estimators to address concrete research questions. They will also be familiar with the central assumptions and challenges of the applied methods and be able to critically evaluate the quality of empirical studies. Along the way, the course teaches students how to conduct their own empirical research project and perform an appropriate data analysis using Stata. The course is a good basis for an empirical Master's thesis.

Instructor

Prof. Dr. Kamila Cygan-Rehm
Office hours: Tuesday, 2:50 – 4:20 pm, HÜL 308

Modules

MA-WW-ERG-3804/ WW-MA-205-ATAE, DWW-ERG-3804/WW-D-205-ATAE, WW-MA-PIE-ATE: Advanced Topics in Applied Econometrics

Schedule

Lecture (weekly): Tuesday, 4:40 – 6:10 pm, HÜL S390, Begin on April 15, 2025.
Tutorials (biweekly): Tuesday, 1:00 – 2:30 pm, SCH B247, Begin on April 22, 2025.
Exam: During the regular exam period, the exact date and room will be communicated on time.

Requirements

A basic knowledge of causal inference methods is required, as taught in the modul Empirical Economics. For a refresher, see the textbook "Causal Inference. The Mixtape" by Scott Cunningham (publically available online).

The course language is English. Participants should have a sufficient command of English to actively participate in the lecture and the tutorials (i.e., level B2 of the Common European Framework of Reference for Languages).

Resources:

The lecture slides and problem sets for the tutorials will be provided via OPAL. For access, please log into OPAL via your TU Dresden account and register for this course. The number of participants is limited to 30 students. Hands-on data exercises using Stata will be conducted within the regular lecture time in a PC-Pool.

The course is mainly based on papers and the following textbooks:

Cunningham, Scott. Causal inference: The mixtape. Yale University Press, 2021. Available online at https://mixtape.scunning.com/

Huntington-Klein, N. (2021). The Effect: An Introduction to Research Design and Causality. Chapman and Hall/CRC. Available online at https://theeffectbook.net

Further recommended literature:

Angrist, J. D., & Pischke, J. S. (2015). Mastering 'metrics: The Path from Cause to Effect. Princeton University Press. For accompanying materials, see https://www.masteringmetrics.com/

Huber, M. (2023). Causal Analysis: Impact Evaluation and Causal Machine Learning with Applications in R. MIT Press. Available online at https://mitpress.ublish.com/ebook/causal-analysis-impact-evaluation-and-causal-machine-learning-with-applications-in-r-preview/12759

Assessment

Written exam, duration 90 minutes. The exam language is English.